



Ciguatera Poisoning: A Fishy Food Chain

Toxins from algae



(Credit: PureStock/Alamy Stock Photo) The plague of blood being enacted from the 1956 blockbuster movie "The Ten Commandments".

Captain James Cook's crew was poisoned in 1786.

We were
poisoned!



DESCRIPCION DE DIFERENTES PIEZAS DE HISTORIA NATURAL

LAS MAS
DEL RAMO MARITIMO,
REPRESENTADAS
EN SETENTA Y CINCO LAMINAS.

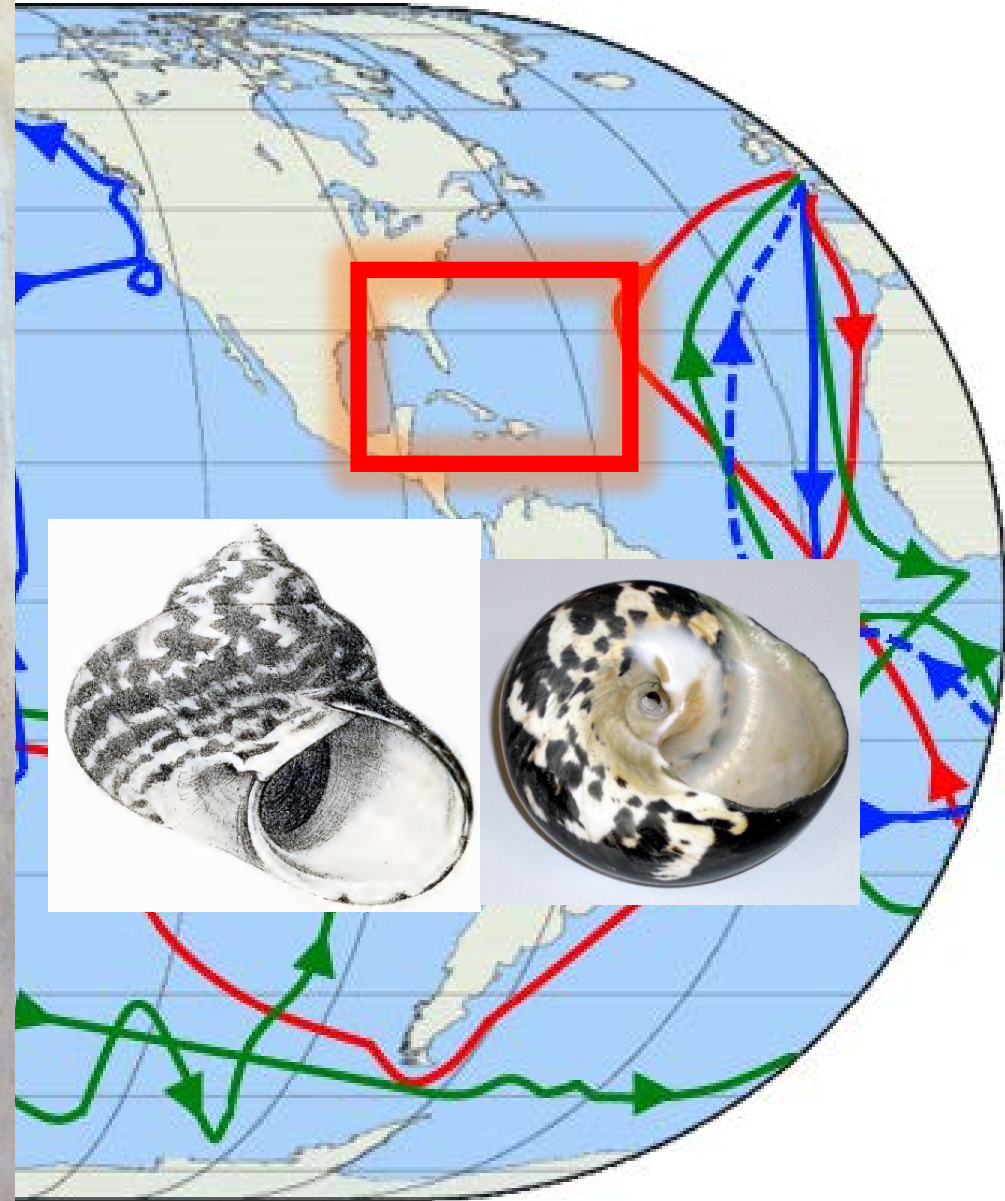
SU AUTOR
Don Antonio Parra.



EN LA HAVANA AÑO DE 1787.

CON LAS LICENCIAS NECESARIAS.

En la Imprenta de la Capitanía General.



What is Ciguatera poi

Ciguatoxin

MENU
Predatory Reef Fish
Barracuda
Snapper
Moray Eel
Parrot Fish
Grouper
Tiger Fish
Amberjack

heat s
parasthesi

13.

CIGUATERA POISONING.
CAUSED BY EATING TROPICAL FISH, CAN MAKE COLD WATER FEEL BURNING HOT AND VICE VERSA.

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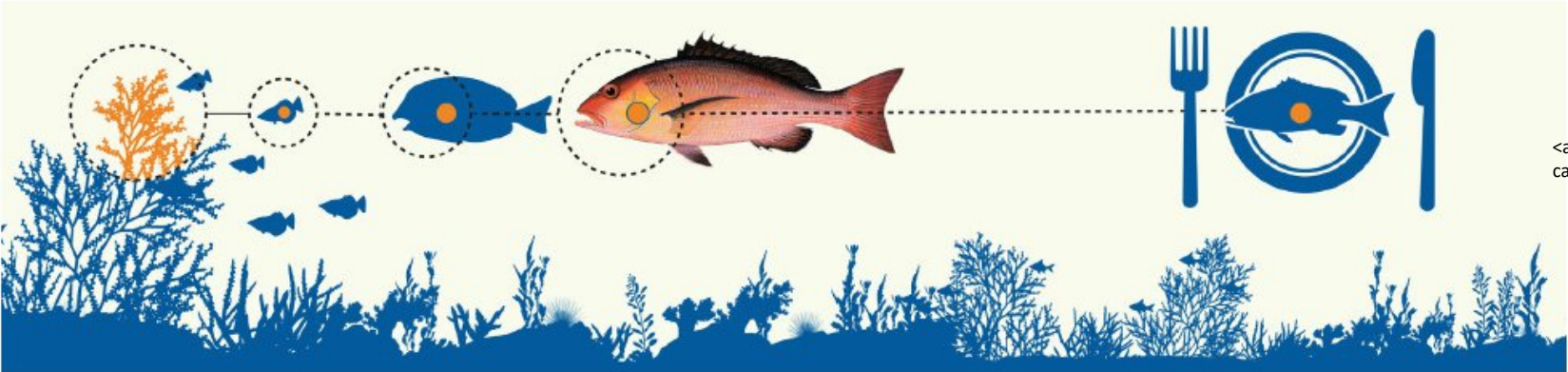


Food web contamination (simplified)



https://www.freepik.com/free-vector/happy-kid-fishing-cartoon-character_29094692.htm Image by brgfx on Freepik

Changes in coral reefs



Proliferation of toxic dinoflagellates



Toxic dinoflagellates eaten by small herbivorous fish



Small fish eaten by larger carnivorous fish



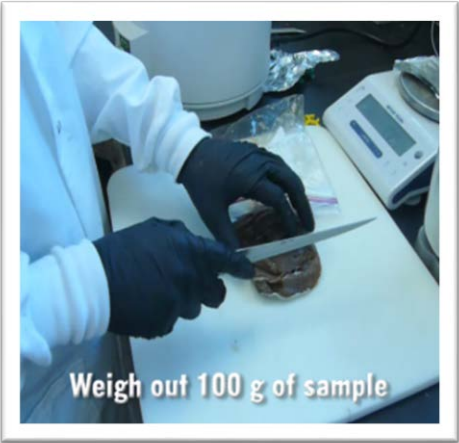
Fish eaten by human



Ciguatera fish poisoning (CFP)

The toxic dinoflagellates, mainly *Gambierdiscus*, can produce Ciguatoxins (CTXs)

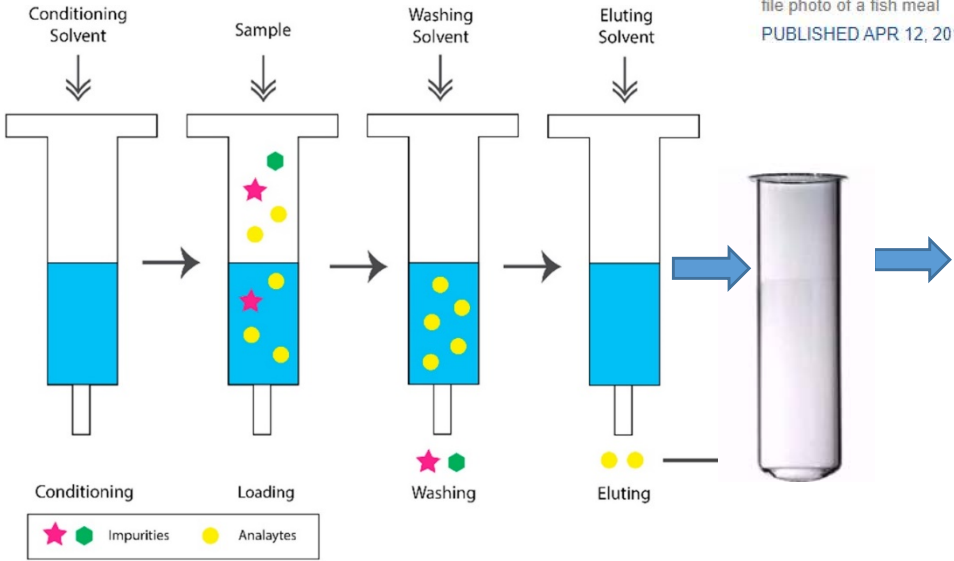
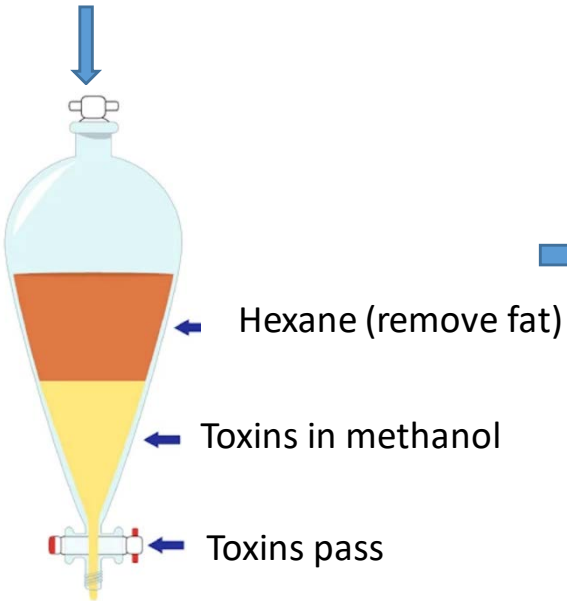
Ciguatoxin extraction



Fish Dinner Sends 14 to Hospital



file photo of a fish meal
PUBLISHED APR 12, 2015 8:44 PM BY WENDY LAURSEN



Detection

Analysis: Two-tiered approach

Extraction

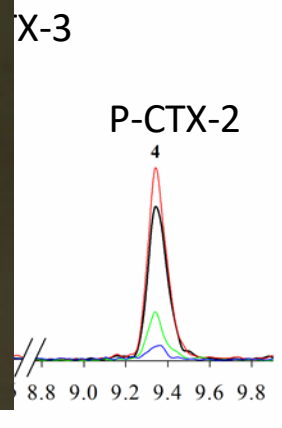
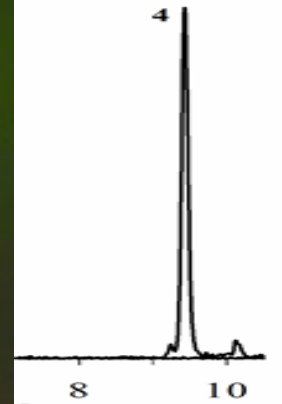


Harmful Algal
Loeffler et al.



<https://hlavko.webnode.cz/fotogalerie/savci/>

n
ation



time [min]

But wait there's more!

2017 outbreak in Germany:
'Label might not match your meat'

Sold as: *Lutjanus malabaricus* (Red Snapper)

Actual product label:

FROZEN RED SNAPPER 170/230
(LUTJANUS MALABARICUS)

Identified as:

L. bohar via DNA barcoding

Untersuchungsergebnisse

Analyse

Ergebnis

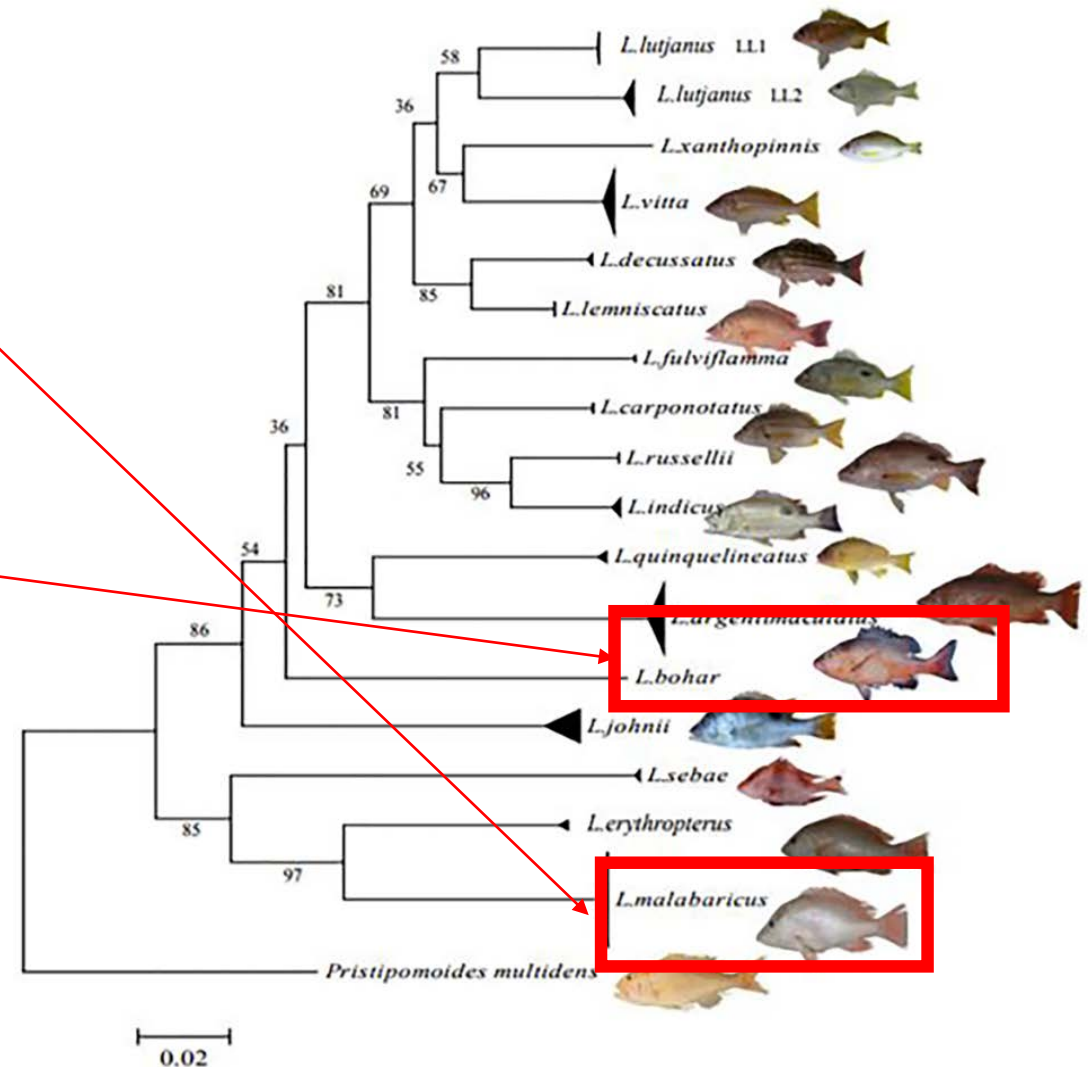
Methode

Fischartendifferenzierung

17-0050182-001-01 (Filet 1)
17-0050182-001-02 (Filet 2)
17-0050182-001-03 (Filet 3)
17-0050182-001-04 (Filet 4)
17-0050182-001-05 (Filet 5)

99% Sequenz-Homologie zu *Lutjanus bohar*
100% Sequenz-Homologie zu *Lutjanus bohar*
100% Sequenz-Homologie zu *Lutjanus bohar*
100% Sequenz-Homologie zu *Lutjanus bohar*
100% Sequenz-Homologie zu *Lutjanus bohar*

Sequenzierung Cyt c Oxidase
Untereinheit I



Considerations for consumers

1. Be careful – ask locals
2. Avoid the head, eggs, liver
3. If poisoned seek medical help
4. Support science!



Toxic fish

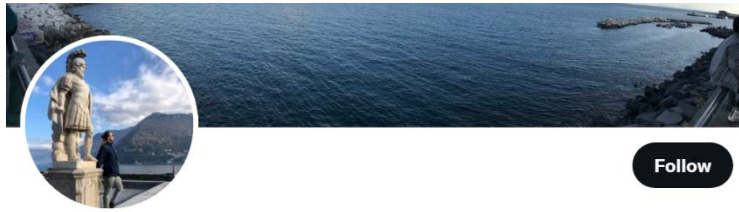
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Thank you!



Christopher Loeffler
@TravelOceans

